

What is claimed is:

- 1 1. A method for setting up an up-stream communication session in a basic
2 service set (BSS) in a wireless network, the communication session having a defined Quality
3 of Service (QoS), the method comprising steps of:
4 detecting a first Path message and a first Resv message (Path/Resv message)
5 of a RSVP protocol at a designated subnet bandwidth manager (DSBM) in a station having a
6 point coordinator (PC), the first Resv message originating from a RSVP agent of a host
7 outside the BSS, and requesting for setting up an up-stream session between a source non-PC
8 station in the BSS and the PC station;
9 extracting at the DSBM a QoS parameter set and a classifier from the first
10 Path/Resv message for the session;
11 determining at the DSBM whether to admit the up-stream session to the
12 network based on the QoS parameter set defining the session and a channel status report on a
13 medium access control (MAC) sublayer of the BSS;
14 when the up-stream session is admitted, setting up by a QoS management
15 entity (QME) of the PC station a virtual up-stream (VUS) between the source non-PC station
16 and the PC station for transporting the up-stream session traffic; the DSBM being part of the
17 QME in the PC station.

- 1 2. The method according to claim 1, further comprising steps of:

2 assigning by the QME a virtual stream identifier (VSID) to the VUS; and
3 instructing by the QME a frame scheduling entity (FSE) to create an entry
4 corresponding to the VDS in a frame scheduling table of the FSE, the FSE being logically
5 located in the MAC sublayer of the PC station, the entry in the frame scheduling table
6 including the VSID and the QoS parameter set associated with the up-stream session.

1 4. The method according to claim 3, further comprising steps of:

2 receiving the management frame by the source non-PC station;

3 passing the information contained in the management frame to a QME of the

4 non-PC station;

5 instructing by the QME a frame classification entity (FCE) to create an entry

6 corresponding to the VUS in a frame classification table of the FCE, the FCE being logically

7 located in the LLC sublayer of the non-PC station, the entry in the frame classification table

8 including the VSID and the classifier associated with the up-stream session; and

9 instructing by the QME a frame scheduling entity (FSE) to create an entry
10 corresponding to the VUS in a frame scheduling table of the FSE, the FSE being logically
11 located in the MAC sublayer of the non-PC station, the entry in the frame scheduling table
12 including the VSID and the QoS parameter set associated with the up-stream session.

1 5. The method according to claim 2, further comprising steps of:
2 detecting a second Path/Resv message at the DSBM, the second Path/Resv
3 message originating outside the DSBM and requesting a change of at least one QoS
4 parameter value associated with the up-stream session;
5 extracting at the DSBM the changed QoS parameter set and the classifier from
6 the second Path/Resv message for the session;
7 finding at the QME of the PC station the VSID that is associated with the
8 extracted classifier;
9 determining at the QME of the PC station whether to grant the request for
10 change based on the changed QoS parameter set and the channel status report;
11 when the request is not granted, operating the up-stream session according to
12 the QoS parameter set contained in the frame scheduling table in the PC station for the VUS;
13 and
14 when the request is granted, instructing by the QME of the PC station the FSE
15 of the PC-station to update the entry in the frame scheduling table corresponding to the VUS

16 by changing at least one QoS parameter value associated with the VUS based on the
17 requested change.

1 6. The method according to claim 5, wherein when the request is granted, further
2 comprising a step of sending a management frame from the PC station to the source non-PC
3 station, the management frame including information relating to a change of at least one QoS
4 parameter value associated with the up-stream session defined by the VSID.

1 7. The method according to claim 6, further comprising steps of:
2 receiving the management frame by the source non-PC station;
3 passing the information contained in the management frame to the QME of
4 the non-PC station; and
5 instructing by the QME of the non-PC station the FSE of the non-PC station
6 to update the entry corresponding to the VUS in the frame scheduling table of the FSE by
7 changing at least one QoS parameter value associated with the VUS based on the information
8 contained in the received management frame.

1 8. The method according to claim 2, further comprising steps of:
2 detecting a third Path/Resv message at the DSBM, the third Path/Resv
3 message originating outside the DSBM and requesting that the up-stream session be

4 terminated;
5 extracting at the DSBM the classifier from the third Path/Resv message for
6 the session;
7 finding at the QME of the PC-station the VSID that is associated with the
8 extracted classifier;
9 instructing by the QME of the PC station the FSE of the PC station to delete
10 the entry corresponding to the VUS in the frame scheduling table; and
11 sending a management frame from the PC station to the non-PC station
12 sourcing the VUS defined by the VSID, the management frame including information
13 relating to a teardown of the VUS.

1 9. The method according to claim 8, further comprising steps of:
2 receiving the management frame by the addressed non-PC station;
3 passing the information contained in the management frame to the QME of
4 the non-PC station;
5 instructing by the QME of the non-PC station the FCE of the non-PC station
6 to delete the entry corresponding to the VUS in the frame classification table; and
7 instructing by the QME of the non-PC station the FSE of the non-PC station to delete the
8 entry corresponding to the VUS in the frame scheduling table.

1 10. The method according to claim 8, further comprising steps of:
2 detecting a timeout event at the DSBM, the timeout event being triggered by a
3 predetermined length for not receiving one of the first Path/Resv message and the second
4 Path/Resv message for an up-stream session;
5 extracting at the DSBM the classifier from one of the first Path/Resv message
6 and the second Path/Resv message previously received for the up-stream session;
7 finding at the QME of the PC station the VSID that is associated with the
8 extracted classifier;
9 instructing by the QME of the PC station the FSE of the PC-station to delete
10 the entry corresponding to the VUS in the frame scheduling table; and
11 sending a management frame from the PC station to the non-PC station
12 sourcing the VUS defined by the VSID, the management frame including information
13 relating to a teardown of the VUS.

1 11. The method according to claim 10, further comprising steps of:
2 receiving the management frame by the addressed non-PC station;
3 passing the information contained in the management frame to the QME of
4 the non-PC station;
5 instructing by the QME of the non-PC station the FCE of the non-PC station
6 to delete the entry corresponding to the VUS in the frame classification table; and

12. The method according to claim 1, wherein before the step of detecting the Resv message at the DSBM, the method comprises steps of:

- receiving the first Path message for the up-stream session at the DSBM, the first Path message being sent from an SBM of the source non-PC station in the BSS;
- propagating the first Path message for the up-stream session from the DSBM to an RSVP agent of each destination station located outside the BSS;
- receiving the first Resv message for the up-stream session at the DSBM, the first Resv message being sent from an RSVP agent of a destination station located outside the BSS and propagated to the DSBM;

wherein after the step of determining at the DSBM whether to admit the down-stream session to the network, the method further comprises a step of sending the first Resv message for the session from the DSBM to the SBM of the source non-PC station in the BSS that is intended for resource reservation confirmation only.

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1 14. A point coordinator (PC) station in a basic service set (BSS) in a wireless
2 network, the PC station comprising:
3 a designated subnet bandwidth manager (DSBM) detecting a first Path
4 message and a first Resv message (Path/Resv message) of a RSVP protocol, the first Resv
5 message originating from a RSVP agent of a host outside the BSS and requesting to set up an
6 up-stream session between a source non-PC station in the BSS and the PC station, the DSBM
7 extracting a Quality of Service (QoS) parameter set and a classifier from the first Path/Resv
8 message for the session, and determining whether to admit the up-stream session to the
9 network based on the QoS parameter set defining the session and a channel status report on a
10 medium access control (MAC) sublayer of the BSS; and
11 a QoS management entity (QME), responsive to the an admitted up-stream
12 session, by setting up a virtual up-stream (VUS) between the source non-PC station and the
13 PC station for transporting the up-stream session traffic; the DSBM being part of the QME in
14 the PC station.

1 15. The PC station according to claim 14, wherein the QME assigns a virtual
2 stream identifier (VSID) to the VUS and instructs a frame scheduling entity (FSE) to create
3 an entry corresponding to the VDS in a frame scheduling table of the FSE, the FSE being
4 logically located in the MAC sublayer of the PC station, the entry in the frame scheduling
5 table including the VSID and the QoS parameter set associated with the up-stream session.

1 18. The PC station according to claim 15, wherein the DSBM detects a second
2 Path/Resv message, the second Path/Resv message originating outside the DSBM and
3 requesting a change of at least one QoS parameter value associated with the up-stream
4 session, the DSBM extracting the changed QoS parameter set and the classifier from the
5 second Path/Resv message for the session,

6 wherein the QME of the PC station finds the VSID that is associated with the
7 extracted classifier and determines whether to grant the request for change based on the
8 changed QoS parameter set and the channel status report,

9 wherein when the request is not granted, the up-stream session is operated
10 according to the QoS parameter set contained in the frame scheduling table in the PC station
11 for the VUS, and

12 wherein when the request is granted, QME of the PC station instructs the FSE
13 of the PC-station to update the entry in the frame scheduling table corresponding to the VUS
14 by changing at least one QoS parameter value associated with the VUS based on the
15 requested change.

1 19. The PC station according to claim 18, wherein when the request is granted,
2 the QME of the PC station sends a management frame from the PC station to the source non-
3 PC station, the management frame including information relating to a change of at least one
4 QoS parameter value associated with the up-stream session defined by the VSID.

1 20. The PC station according to claim 19, wherein the source non-PC station
2 includes a local QME, a local FCE that is logically located in the LLC sublayer of the source
3 non-PC station and a local FSE that is logically located in the MAC sublayer of the source
4 non-PC station, the source non-PC station receiving the management frame and passing the
5 information contained in the management frame to the local QME, and
6 wherein the local QME instructs the local FSE to update the entry
7 corresponding to the VUS in the frame scheduling table of the local FCE by changing at least
8 one QoS parameter value associated with the VUS based on the information contained in the
9 received management frame.

1 21. The PC station according to claim 14, wherein the DSBM detects a third
2 Path/Resv message, the third Path/Resv message originating outside the DSBM and
3 requesting that the up-stream session be terminated, the DSBM extracting the classifier from
4 the third Path/Resv message for the session,
5 wherein the QME of the PC station finds the VSID that is associated with the
6 extracted classifier, instructs the QME of the PC station the FSE of the PC station to delete
7 the entry corresponding to the VUS in the frame scheduling table, and sends a management
8 frame from the PC station to the non-PC station sourcing the VUS defined by the VSID, the
9 management frame including information relating to a teardown of the VUS.

1 22. The PC station according to claim 21, wherein the non-PC station sourcing
2 the VUS includes a local QME, a local FCE that is logically located in the LLC sublayer of
3 the source non-PC station and a local FSE that is logically located in the MAC sublayer of
4 the source non-PC station, the non-PC station sourcing the VUS receiving the management
5 frame and passing the information contained in the management frame to the local QME, and
6 wherein the local QME instructs the local FCE to delete the entry
7 corresponding to the VUS in the frame classification table, and instructs the local FSE to
8 delete the entry corresponding to the VUS in the frame scheduling table.

1 23. The PC station according to claim 21, wherein the DSBM detects a timeout
2 event, the timeout event being triggered by a predetermined length elapsing and not receiving
3 one of the first Path/Resv message and the second Path/Resv message for an up-stream
4 session, the DSBM extracting the classifier from one of the first Path/Resv message and the
5 second Path/Resv message previously received for the up-stream session, and
6 wherein the QME of the PC station finds the VSID that is associated with the
7 extracted classifier, instructs the FSE of the PC-station to delete the entry corresponding to
8 the VUS in the frame scheduling table, and sends a management frame from the PC station to
9 the non-PC station sourcing the VUS defined by the VSID, the management frame including
10 information relating to a teardown of the VUS.

1 24. The PC station according to claim 23, wherein the non-PC station sourcing
2 the VUS receives the management frame and passes the information contained in the
3 management frame to the local QME, and

4 wherein the local QME instructs the local FCE to delete the entry
5 corresponding to the VUS in the frame classification table, and instructs the local FSE to
6 delete the entry corresponding to the VUS in the frame scheduling table.

1 25. The PC station according to claim 14, wherein before the DSBM detects the
2 Resv message, the DSBM receives the first Path message for the up-stream session, the first
3 Path message being sent from an SBM of the source non-PC station in the BSS, the DSBM
4 propagating the first Path message for the up-stream session to an RSVP agent of each
5 destination station located outside the BSS, the DSBM then receives the first Resv message
6 for the up-stream session, the first Resv message being sent from an RSVP agent of a
7 destination station located outside the BSS and propagated to the DSBM, and

8 wherein after the DSBM determines whether to admit the down-stream
9 session to the network, the DSBM sends the first Resv message for the session to the SBM of
10 the source non-PC station in the BSS, the first Resv message including information related to
11 resource reservation confirmation.

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- 1 26. The PC station according to claim 14, wherein the wireless network is a
- 2 wireless local area network (WLAN).

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